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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,377	12/12/2003	Kazuhito Ichinose	501.43296X00	8552

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EXAMINER

THOMAS, TONIAE M

ART UNIT PAPER NUMBER

2822

DATE MAILED: 11/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/733,377

**Applicant(s)**

ICHINOSE ET AL.

**Examiner**

Toniae M. Thomas

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-23,28 and 29 is/are allowed.
- 6) ☒ Claim(s) 1-4,7,25 and 27 is/are rejected.
- 7) ☒ Claim(s) 5,6,24,26 and 30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 14 October 2005 has been entered.
2. The amended filed on 14 October 2005 added claims 27-30. Accordingly, claims 1-30 are currently pending.
3. Applicant's arguments, filed on 14 October 2005, with respect to the rejection of claim 1 under 35 USC 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground of rejection is made in view of Murphy et al. (US 6,117,771). The new ground of rejection follows.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Murphy et al. (US 6,117,771).<sup>1</sup>

The Murphy et al. patent (Murphy) discloses a method for forming a cobalt silicide film. The method comprises: a first step of depositing a cobalt film on a bare silicon surface of the main surface of a silicon substrate (col. 4, lines 31-43); and a second step of heat treating the silicon substrate to form a silicide layer on the interface between the substrate and the cobalt film (col. 4, lines 43-55), wherein in the first step, the cobalt film is deposited at a temperature lower than a temperature at which a reaction layer of silicon and cobalt is formed on the interface between the bare substrate surface and the cobalt film (col. 4, lines 40-43). A temperature lower than the reaction temperature is maintained until the end of the deposition step (col. 4, lines 40-43).

The cobalt film may be deposited at a temperature less than 200°C (col. 4, lines 40-43).

The cobalt film may be deposited at a temperature less than 100°C (col. 4, lines 40-43).

The cobalt film may be deposited at a temperature less than 50°C (col. 4, lines 40-43).

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<sup>1</sup> The Murphy et al. patent was relied on in the previous Office action.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy.

Murphy does not teach that the deposition step is performed for 15 seconds or less. However, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to perform the deposition step for 15 seconds or less as recited in claim 25, since it has been held that where general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art (*In re Aller*, 05 USPQ 233).

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy in view of Agnello et al. (US 6,440,851 B1).<sup>2</sup>

Murphy lacks anticipation of depositing an oxidation barrier film over the cobalt film prior to the heat treatment step.

The Agnello et al. patent (Agnello) discloses a method for forming a metal silicide film (figs. 1a-1d and accompanying text). The method comprises:

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<sup>2</sup> The Agnello et al. patent was relied on in the previous Office action.

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depositing a metal film 14 over a silicon substrate 10, wherein the metal film is preferably a cobalt alloy (fig. 1a and col. 4, lines 31-35); and forming an oxygen barrier film 16 on the metal film prior to heat treating the metal film to form a metal silicide (fig. 1b and col. 4, lines 57-58).

Both Murphy and Agnello are from the same field of endeavor, methods for forming metal silicides. Therefore, the reason for which Agnello is relied upon would have been recognized in the pertinent reference to Murphy by one of ordinary skill in the art at the time the invention was made.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify Murphy by forming an oxidation barrier layer over the cobalt film prior to the heat treatment step, as taught by Agnello, because the oxidation barrier layer prevents the formation of a native oxide layer on the surface of the cobalt film.

#### ***Allowable Subject Matter***

7. Claims 5, 6, 24, 26, and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 8-23, 28, and 29 are allowable over the prior art of record.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (571) 272-1846. The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 5:30 p.m.

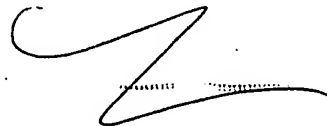
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on (571) 272-2429. The

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fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMT  
27 November 2005

A handwritten signature in black ink, appearing to be 'Mary Wilczewski', written over a horizontal line.

**Mary Wilczewski**  
**Primary Examiner**